

Information

Clinical Management of Patients with Prosthetic Valves

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Replacement of diseased heart valves has created a large number of patients with prosthetic valves. A prosthetic valve may be inserted in the mitral, tricuspid or aortic position, or any combination of these. Artificial atrioventricular valves usually consist of a caged plastic disc or ball; the most commonly used mitral prosthetic valve in our institution is the Beall valve. The cloth-covered Starr-Edwards ball valve has become the most widely used aortic valve prosthesis. The clinical problems presented by patients with the varied kinds of prosthetic valves are similar.

General Considerations

The care of the patient with the prosthetic valve requires close, careful follow-up. It has been our practice to keep patients in the hospital for at least two weeks after operation. By this time there should be no residual problems relating to fever, infection, unrecognized leaks around the prosthetic valve, hemolysis, post-pericardiotomy symptoms, or anticoagulation. If the level of anticoagulation is adequate and the anticoagulant dosage has been stabilized, we recommend that the patient be seen one week

after discharge, then monthly for the next six months. At six months we urge recatheterization of all patients with prosthetic valves. It has been our experience that most patients readily accept this and that a great deal of significant information can be obtained relevant to the function of the valve, the presence of valvular insufficiency, and the state of myocardial contractility.

Patients with a prosthetic valve should be encouraged to live relatively normal lives. We urge our patients to resume their full activities gradually over a six-month period. Most patients appreciate general guidelines for resumption of activity. Occasionally one asks for day-to-day activity schedules. The basic guideline which we set is gradual progression of activity to limits of tolerance. A reasonable social and sexual life is encouraged. We discourage smoking and the use of alcoholic beverages, the latter because of difficulty which may be encountered in maintenance of prothrombin time control. Our patients are usually urged to remain on a 1 gram (or less) sodium diet. We suggest that our patients inform their dentists that they have a prosthetic valve.

Specific Considerations

There are a number of important specific aspects which are involved in the day-to-day care of patients with prosthetic valves. First, each patient should have a thorough physical examination on each visit to his doctor. Great attention must be given to the quality of the prosthetic valve sounds. While it is beyond the scope of this paper to discuss the subtleties of prosthetic valve opening and closing sounds, suffice it to say that the physician should be aware of what any patient's prosthetic valve sounds like, and must be alerted by any changes which occur in these sounds. It also behooves the physician to be aware of any regurgitant murmurs suggesting a paravalvular or valvular leak.

It is usually necessary for these patients to take one of the cardiac glycosides. Many patients with prosthetic valves are in atrial fibrillation and require glycosides for control of ventricular rate. With rare exceptions, we prescribe digoxin, 0.25 to 0.5 mg daily. Coincident with the use of digitalis the physician must determine the serum potassium level at frequent intervals. If the patient is receiving diuretic

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therapy, we encourage the use of potassium chloride supplementation. Dietary intake is usually insufficient to maintain normal serum potassium levels in most patients taking even small doses of diuretics. We supplement the diet with 10 ml of 10 percent potassium chloride three times a day, or 1 ounce of the sugar-free potassium chloride solution (20 mEq) three times a day. Potassium chloride tablets should not be used. The incidence of digitalis intoxication will be reduced in reverse relation to the physician's ability to maintain an adequate serum potassium level.

We have adopted the principle of permanent anticoagulation therapy for all patients with mitral and tricuspid prosthetic valves. Formerly, we felt that a six-month period of anticoagulation was adequate, but we have recently encountered a sufficient number of late emboli even with the Beall valve to alter our policy. On the other hand, we prescribe anticoagulant therapy for the patients with cloth-covered aortic prosthetic valves for six months only, unless an embolic episode occurs, in which case permanent anticoagulation is used. Patients who are taking anticoagulants must be instructed that the coagulation mechanism has been disturbed by the medication and to call to their physician's attention any problems of oozing or bleeding. Aspirin must be avoided. We encourage all patients receiving anticoagulants to look at their stools periodically and to report any darkening.

The use of rheumatic fever prophylaxis in patients with prosthetic valves is a controversial subject. Many groups discontinue routine prophylaxis at an arbitrary age, usually 21. We have elected to continue daily penicillin therapy in all of our patients with known or suspected rheumatic heart disease, substituting erythromycin for any who are allergic to penicillin. It is critical that the principles of subacute bacterial

endocarditis prophylaxis be applied to any patient with a prosthetic valve who is to undergo a dental or surgical procedure. We have seen bacterial endocarditis in patients who were not receiving appropriate prophylactic antibiotic therapy before a minor dental procedure. Our policy has been to adhere to the recommendations laid down by the American Heart Association*. For procedures involving the gastrointestinal or urinary tract, streptomycin is given in addition to penicillin.

It has been recently realized that all patients with prosthetic valves have some degree of hemolytic anemia. This is manifest by elevated serum LDH, reticulocytosis and hemosiderinuria. Two problems may emerge in association with the hemolytic anemia. First, the patient may become iron-deficient because of the loss of iron in the urine. Second, increased erythropoiesis exaggerates the daily requirement for folic acid. It has therefore been our policy to treat all patients with prosthetic valves with both iron and folic acid as long as there is any evidence of significant hemolytic anemia. Fortunately, serious hemolysis usually ends within six months, as the valve becomes endothelialized. The occasional patient will have need for intermittent packed cell transfusion over the first three to four months following valve insertion because of severe hemolytic anemia.

A final point for emphasis concerns routine follow-up with an electrocardiogram and x-ray film of the chest every six months for all patients with prosthetic valves. The electrocardiogram serves as an index of heart rhythm and rate, and calls attention to problems, such as digitalis intoxication, which can be missed clinically. The serial valuation of heart size by roentgen films is an important adjunct in evaluating the patient's progress.

*Management of Dental Problems in Patients with Cardiovascular Disease (EM 349) Prevention of Bacterial Endocarditis (EM 113B) OBTAIN FROM YOUR LOCAL HEART ASSOCIATION